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# CONTENTS

<i>Waves and the Hurricane</i> , <i>Ernest E. Riebel</i> , U. S. N. S.	155
(Illustrated with three plates)	
<i>The Offshoots History of Great Britain—An History and a Part</i> , <i>George F. Smith, Jr.</i>	245
<i>Geographic Names in the History of Great Britain, Canada, Florida,</i> <i>River Valley with A. H. Thompson,</i>	251
<i>Appendix: Names for the Geography of Geographic Names</i> <i>Compiled by G. Smith</i>	
<i>British System,</i>	275
<i>French System,</i>	281
<i>German System,</i>	285
<i>Alphabetical Names in English,</i>	291
<i>English Names,</i>	295

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KOREA AND THE KOREANS.

By J. B. HERSADOV.

(Abstract of lecture, with the addition of some new material.)

THE Koreans are to be noted among nations for the possession of two very different vehicles for the expression of thought, which they put to nearly parallel uses for general needs of communication: a simple and very perfect alphabet, and a complex system of hieroglyphics. The alphabet they owe to the Buddhist priests, missionaries, who took the idea of letters from their sacred books, and developed the Korean symbols for the writing of tracts and prayers; the hieroglyphics came from the mother country and civilizer, China.

The needs of a simpler mode of writing for the intelligent, non-literary classes of Japan, had led in that country to a similar development; but there progress stopped at a syllabary, and the alphabetic stage was not reached.

Until within the past few years the development of accurate maps and charts of Korea has been retarded, partly from a lack of reliable information concerning Korean proper names, and partly from the absence of systematic surveys of the coast. Very recently, however, the difficulties of map-making have been considerably lessened through the efforts of students of the Korean language, who have developed exact systems of transliteration,

by the application of which the sounds of Korean proper names may be correctly expressed in our own letters. At the present day it would seem possible, therefore, to fix, by common consent, upon a general, systematic orthography for Korean proper names, to be used upon the charts prepared by all those nations employing Roman letters; and this without serious danger of clashing with previously developed national systems, or having to undo much work done by others.

The system of transliteration developed by Mr. E. M. Satow, of the British Diplomatic Service, which has been put to practical use by that gentleman in his work entitled "*List of Korean Geographical Names*," would seem well adapted to meet future needs. It gives a simple series of equivalents for Korean sounds, and is remarkably free from diacritical marks. Mr. Satow's system has recently been employed by English and German authors, while efforts to extend its application would seem to have met thus far with no opposition.

The French system of transliteration, which antedates the one above referred to, was developed by the French Roman Catholic Missionaries in Korea, and has been employed by them in their admirable works the "*Grammaire Coréenne*" and the "*Dictionnaire Coréen*," by far the most important yet prepared upon the language, and the first given to the outer world. The missionaries aimed at reproducing native speech, and to this end faithfully copied symbols representing shades of sound that are not to be appreciated by the foreign ear, and which in fact are often neglected in conversation by the Koreans of the present day—for the *Onmun*, or native alphabet, has long since lost its purely phonetic character. The simplicity of the French system is marred, therefore, by the use of a multiplicity of letters, which, appearing in the form of aggregations of consonants or of vowels, are more apt to mislead than to guide.

Inasmuch as the proper names upon native maps, which are invariably written in the Chinese, may be correctly rendered into English, whereas attempts at the systematic transliteration of Chinese characters have generally failed, it may be well to allude to the points of difference in the two cases. The possibility of the transliteration of Korean depends upon the following: (1) that the Korean pronunciation of Chinese characters is independent of the pitch of the voice or *tone*; (2) that the native alphabet is especially constructed with a view to the easy reproduction



of the Korean pronunciation of the same; (3) that the Korean pronunciation of these characters is quite uniform throughout the whole extent of the country; (4) that the Korean equivalents may be readily transliterated into English. All that is necessary, therefore, in fixing a geographic name is to have it written correctly in Chinese and in the *On-mun*. From the latter the English equivalent may be readily obtained. The need of the Chinese form arises from the fact that but few of the natives spell correctly, while many of them write Chinese well; so that it becomes necessary to refer both writings to some authority, by whom the native spelling may be verified.

Wide spread as is the use of the Chinese nomenclature, it is none the less evident that the system is an artificial one, and that its employment must end somewhere. In those parts of the country that are the least explored, and where educational facilities are wanting, in the mountain fastnesses of the north, and among the many islands of the Yellow Sea, important geographic names occur that possess no Chinese equivalents; native words capable of being written only in the *On-mun* and which derive their origin from local peculiarities. To ascertain these correctly the services of an educated Korean are required; and it may be added here that no surveying party on the Korean coast should be without the services of a native guide, capable of speaking a few words of English. Such a man may be picked up at an open port. He would be useful in many ways: in preventing the destruction of signals from superstitious motives by the natives; in ascertaining from fishermen the existence of dangers in the intricate coast waters; in marking the position of towns and villages not to be seen from their sea approaches; and in securing supplies of fresh provisions.

The preliminary study of the geography of an eastern country necessitates the comparative examination of data gathered from widely different sources: the early partial surveys of the coasts by mariners, and the rough maps made by the natives themselves. Inasmuch as large sections of the Korean coast are as yet hardly examined, and since it is only within the last few years that foreigners have been allowed to penetrate into the interior, it follows that no accurate map of the land exists. In selecting bases for future developments it becomes necessary, therefore, to examine the various approximate representations, and to determine which of them is best adapted to aid the work in hand.

Many writers upon Korea seem prone to attribute the mapping of the country to the result of explorations and observations made by foreigners. I believe this assumption to be erroneous and think it can be readily proven that, although the Koreans may have known practically nothing of the outside world up to the time of the treaties, some twenty years ago, they had, nevertheless, long before this formed an excellent idea of the configuration of their own country. The first important work accomplished by outsiders was the survey of the common boundary of Korea and China by the Jesuits, acting under the orders of the Chinese Emperor Kang-hsi, in the year 1700. Severity of climate and roughness of country prevented the party from making more than a preliminary examination of the districts that they passed through, but a few fair determinations of latitude and approximations to longitude were obtained, and the general direction of the boundary determined. With the aid of these data, supplemented by information from native sources, a map was constructed, in which the Korean peninsula was connected with the general system of the world's coördinates and proper names were given in our own alphabetic characters. This map, which forms the basis of most of the representations of Korea in use at the present day, shows its origin in the transliteration of proper names in accordance with the Mandarin Chinese and not the Korean pronunciation of the Chinese characters employed to represent them.

The information from Korean sources which the missionaries must have utilized in completing their work was doubtless attained by them in the form of native maps. Of these there are several good ones in use at the present day, two of which would seem especially worthy of notice: (1) the large map of twenty sheets dividing the peninsula into sections by parallel lines drawn from east to west, and (2) a map giving the country in eight sheets, by provinces. The key to the latter, showing the entire kingdom, as well as one of the expanded sheets showing the Kyöngsang province in the southeast, and the Nakdong river, the most important stream of the land, are appended to this paper, and will serve to indicate the progress independently attained by the Koreans in the art of map making. These plates have been reproduced from a copy of an original now in the possession of Mgr. J. G. Blanc, the French Missionary Bishop of Korea, to whom it served as an accurate guide at the time of his

of severe persecutions.

The preface of the Korean geographer, which is written in Chinese upon one of the sheets, is of interest, as it illustrates the object of the work, enumerates the classes of data utilized and alludes to difficulties contended with. I therefore quote it here.

"The geographers of my country are quite numerous, but all maps are influenced to a certain extent by the limit of the paper employed in their construction, and so distances are very incorrectly given. Thus ten or more *ri* (Korean unit of distance—about  $\frac{1}{2}$  mile) are sometimes represented as two or three hundred *ri*; while sometimes two or three hundred *ri* are represented as two or three. The bearings given are also incorrect. Such a map offers great disadvantages to people who attempt to learn about their country. Therefore I have taken all care in constructing this one, both as to direction and distances of places, as well as to the situations of mountains and rivers. For distances I have made a scale in which one hundred *ri* are taken as one *ja* (Korean foot), and ten *ri* as one *pon* (Korean inch, ten to the foot). I have laid off distances in all directions from the capital, so that the general shape and position of the eight provinces are correctly represented. The towns, however, are only placed in direction with reference to the provinces to which they belong, without regard to actual distances. Where mountain ranges and rivers are represented as boundaries, they are necessarily repeated upon the sheets of adjoining provinces. In the measurement of distances one *ja* represents one hundred *ri* in level places, and from one hundred and twenty to one hundred and thirty *ri* where the mountains are high."

The assumption that the unit of scale represents an increased distance in mountainous regions is a peculiarity of Chinese as well as of Korean maps. Travelers who copy or cipher are obliged in estimating days' journeys to consider the character of the country ahead before applying the unit of measurement.

An examination of the various conventional features of Plate I and II will afford much information concerning the official subdivision of the country for governmental purposes, and will serve to indicate the facilities of communication that exist in a country where there are no railroads, and where almost every important route extends in a direction normal to that of the flow of the greater number of rivers. The eight provinces of the kingdom

are exhibited upon Plate I as groups of towns, each group being displayed up on the original at a different color all of which, or sunders of various numbers, are fairly well reproduced upon the photo-lithographs. Each town is denoted by a circle of very exaggerated dimensions, large enough to allow its name to be written in Chinese characters in the enclosed area. The apparent multiplicity of characters upon the present map is due to the fact that all names are given in the native Korean, as well as in the Chinese. The employment of the former is unusual, and in the present case was resorted to at my own instance, in order to render the map more generally useful to foreigners. Each town is the seat of government of an officer who is subordinate to a provincial governor. The strength of any portion of Korea may therefore be reckoned in the native way as so many "cities," by the word "city," being understood both the seat of government and the adjacent land over which the governor holds sway. The walled towns, which are quite uniform in type throughout the whole extent of the country, deserve especial mention. They are represented on the map as circles with serrated edges, and a glance at the provincial sheets will show that they are quite numerous, each province possessing from six to twenty of them. The number is greatest along the coast of the Yellow Sea and to the southward, facing Japan.

As secondary fortifications may be mentioned the *San-sung*, or mountain walls, as they are called, built at the least accessible points of the interior ranges, generally in proximity to some thickly settled district. The more ancient are relics of the feudal period, when Korea was governed by petty princes each with his castle upon a rock. The more modern, witnesses of the Japanese invasion of two hundred years ago, when they were either pillaged by the enemy or else held by the people as places of refuge. A number of the *San-sung* are marked upon the present map; those of lesser importance are omitted.

As a Korean institution in the system of communication is maintained at the present time. At the *yuk*, or post stations, represented on the map by double native circles, are kept numbers of the small native native horses, well fed and in good condition, attended by staffs of native couriers who are ready to receive orders from the station-master and spring into saddle upon a moment's notice. The service is well patronized and the couriers frequently employed, partly at the instance of

The government, which has to provide for the necessities and comforts of the people, has a system of posts for the conveyance of the necessities of various kinds. A letter or parcel is thus rapidly transported, from east to west, from south to north, and night except in certain mountainous districts of the north, where the fear of the tiger prevents night travel. Supplies of fruit and game for the royal table are forwarded in this manner to the capital from the most distant parts of the kingdom.

The *jung-wa*, or signal fire stations, are indicated upon the map by small squares placed at the summit of the mountains. They are especially numerous in the coast districts, where their sites are chosen with great care, in such manner that the fires that are lighted at one station are visible from the next, and so on to an advanced point of the interior, whence a single fire may be again flashed on, to form a member of a more extended group. And so the lights proceed, re-collected and re-forwarded until the final combinations are gathered into a final group at the capital, to show that all is well throughout the kingdom.

The faint network of lines extending over the whole country, as shown in the map of the southeastern province, represents the chief public highways, upon the determination of whose length and relative bearing the development of the map is based. In general, roads in Korea are well maintained, and during the greater part of the year are in fair condition. It would be found impossible to take a wheeled vehicle of any kind over them, however; for such use they are not intended, travel in Korea being performed afoot, or with the aid of horse or sedan. During the summer rains the streams run rapidly; the waters pour down from the mountains, each rivulet becomes a torrent and the bridges are swept away. When the floods subside the local authorities compel the peasants to turn out in force and make the necessary repairs; delays of travel are thus reduced to a minimum.

Korea is preeminently a mountainous country. With the exception of the alluvial plains at the mouths of the rivers, low ranges of mountains with narrow intervening valleys are found everywhere, and are characteristic. The main chain, forming the back-bone of the peninsula, is not clearly defined, as it is formed principally by the overlapping and intersections of minor chains, so that it is quite irregular as to direction, but a glance at the sources of the rivers, considered with reference to the intervening line of water-sheds, shows that it springs from the mountains

of Siberia at the north, follows for some distance the line of the eastern coast and then strikes inland, trending to the southward and westward until it reaches the shores of the Yellow Sea. The loftiest ranges, therefore, are in the northern and eastern provinces. At the centre of the northern boundary is Peak-dum-an, the "white-headed mountain," in whose slopes rise the Yalu, Tuman, and Nen-guri rivers, the two former defining the western and eastern sections of the frontier, the latter a tributary of the Amur, an important stream of southern Siberia. According to Messrs. James, Younghusband, and Bulford, of the British Indian and Consular services, who visited it in May, 1886, Peak-dum-an is "a recently extinct volcano with a lovely pruned lake filling the bottom of the crater, surrounded by a serrated edge of peaks rising about 550 feet above the surface of the water. The height of the loftiest of these was found to be about 7,525 feet above the level of the sea."

Besides the rivers of the frontier are others of the interior that deserve a passing mention. The mountainous nature of the country, as well as its proximity to the sea, implies the existence of numerous secondary water courses, but these as a rule are insignificant in size and so shallow as to permit of navigation only throughout limited portions of their extent. Among the larger streams that lie wholly within the country is the Taedong, flowing through P'yŏng-an-do, the northwestern province, rising in the central ranges of the peninsula and flowing into the Yellow Sea. During the greater part of the year it is navigable as far as the city of P'yŏnggyang for small craft of the largest size. In mid-summer its waters rise rapidly during a short rainy season; they quickly subside, the river resuming its former course. To this sudden shoaling may be attributed the loss of the schooner *Sacramento*, captured by the Koreans in 1871, the vessel going aground without warning at a place where a few hours before abundant water had been found.

The Han, the river of the capital, has about one hundred miles to the seaward of the Taedong, and flows westwardly in a nearly parallel direction thereto, from the central ranges of the peninsula into the Yellow Sea. Its many branches join in a common estuary near the centre of the Yellow Sea coast, and their collective drainage area comprises a large portion of central Korea. Still farther to the southward is the Keum, traversing a fertile rice-growing country, while at the extreme south is the

Nakdong. The latter is one of the most important streams of Korea, and the facilities that it affords for communication and exchanges have done much towards rendering the district through which it flows one of the most fertile and prosperous of it.

The coasts of Korea are favourable to the mariner and secure a *salutary* conclusion that it has been *very* *carefully* *examined*. On the east, facing the *open* *ocean*, *the* *coast* *is* *marked* *by* *the* *entrances* *of* *harbours*, *land* *abruptly* *into* *the* *deep* *waters* *of* *the* *Japan* *Sea*. To the westward *innumerable* *outlying* *islands* *extend* *seaward* *many* *miles*, *liberally* *interspersed* *with* *rocks* *and* *shoals*, *between* *which* *eddy* *swift* *streams* *of* *tidal* *water*. The terrors of the *Min* stream would find their counterpart in many a Korean whorlpool, which, forming at the vicinity of some submerged ledge, will cause a large vessel to heel suddenly well over, and will swing her many points off her course in a way to make the stoutest hearted captain tremble for the safety of his charge.

The climate of Korea exhibits wide ranges of temperatures and hygroscopic conditions. In the northeast province, Hamkyung-do, the winter is as rigorous as that of Nova Scotia; at the extreme south, on the island of Quelpart, it somewhat resembles that of Louisiana. The warmth of Quelpart is due to the proximity of the Kuro-siwo, or Black Stream of Japan, the Gulf Stream of the Pacific, part of which is here turned into a cold eddy, from which it escapes with difficulty. One result of this is that the *climate* *is* *very* *variable* *and* *unpredictable*, *and* *the* *mariner* *may* *at* *all* *times* *look* *for* *a* *hard* *blow*. A characteristic feature of Yellow Sea coasts are the Chang-pai, or mid-summer rains, which set in with fair regularity in July and during their month-duration resemble in phenomena and general effects the periodic rains of the tropics. The winters, in all but the southern parts of the country, are long and severe and set in with great suddenness. As an illustration of the rapidity of this change I remember that on one occasion I was ferried across the Han river near the capital at a time when the only indication of cold weather was a film of ice along the river banks, and that within forty-eight hours afterwards I rode back across the river ice on horseback, over the line of the former ferry.

Careful meteorologic records have now been kept at the open ports for more than five years; at Chemulpo, on the Yellow

Sea (the seaport of the capital, Seoul); at Busan, to the south, and at Gensan, to the northeast. Stations are needed on the Yellow Sea coast farther to the northward, at the extreme north-east, at points in the interior, and especially on the island of Cheju Quelpaert, whose weather reports may some day prove as valuable to the Japanese as those from Bermuda would now be to the navigator of the western waters of the Atlantic. All the above mentioned places are easily accessible and doubtless soon will receive attention. In fact, to the navigator of these regions this island of Quelpaert is almost of the importance that Hatteras is to the navigator of our own coast.

As an important factor of Korea's future prosperity, and one that will enter largely into the determination of her future position among the nations of the east, may be mentioned her mineral resources. These yet remain in an almost undeveloped condition. The most easily accessible deposits and out-croppings, which are worked by the natives in primitive ways, afford evidence of an abundant and varied supply of the useful ores and minerals widely distributed throughout the whole extent of the land. Many localities, moreover, are well known to the people for their especial products. Thus the P'yongyang province, in the north-west, famous for its iron, possesses abundant supplies of iron, iron, and lime. Samples of this coal, which is but little used by the people, were collected several years ago from twelve different localities, and I remember that some of the P'yongyang gatherings were tested on board the U. S. S. Albatross, but were found to have suffered so greatly from exposure to the weather as to be comparatively valueless, even for experimental purposes. Limestone is common in this district, and in the town of P'yongyang I have noticed the use of caustic lime in the streets and in the houses. The iron mines at P'yongyang fifty miles to the northward of this city, which is reckoned in the native way, with accuracy, is remarkable for its magnitude and purity. Inasmuch as all these deposits are of very great extent and lie near the sea coast, and in proximity to waters easily navigated by larger craft it may be assumed as probable that the time will soon arrive when the iron of Korea will largely supply the ship-yards and machine shops of northern China. Silver is found in at least four localities; copper is worked in paying quantities in two places; and lead is also found in several localities. The most important of these is near the capital, Seoul, but is said to be of



in Kyōng-sang-do; no ore of mercury is known to the Koreans, who import their supplies of the metal and its preparations from China.

At the time of the opening of Korea by treaty, 1870-80, an impression seems to have prevailed quite generally that the country was extremely rich in gold, that great quantities of the precious metals were soon to be exported, or that mines of great richness would be found and worked. The years that have elapsed have not entirely removed this popular view of these assumptions, yet the doubt is not yet fully removed. Gold is now known to occur in many places in moderate quantities: in alluvial deposits, from which it may be washed by simple mechanical process, and in quartz veins, from which it is extracted in small quantities by crude and laborious methods of rock-pulverizing and washing. A small constant demand for the metal has always existed, for jewelry and gilding: the latter into a common decorative process, which up to the present seems to have required the use of pure gold even for the crudest applications. The mines remain for the greater part unworked, however, for three reasons: (1) the native dislike for altering the geomantic conditions of any locality by digging holes in the ground; (2) the laws forbidding the search for the metal, for gold mining in Korea is a government monopoly; (3) the inability of the peasants to find a market for the gold that they surreptitiously work. There has always existed a chance of disposing of it by crossing the border into China, and there has probably long been a small steady export in this way; and a port has been opened near the capital where hostile Chinese and Japanese merchants who must find a way of converting the Korean copper cash into some medium of exchange easily negotiable abroad, and who for this purpose have been known to purchase gold from the Koreans at a somewhat low price. I have obtained a number of specimens of Korean gold, which have been brought to the metropolis and had passed into the hands of foreign merchants. There are several cases I have observed of pieces of native *ch'ung* that contain grains of the precious metal of considerable size.

In answer to inquiries that I made from time to time during a residence of more than a year in Korea, I was told by the Koreans that a number of *ch'ung* were good and that the metal was abundant. I have endeavored to show these collectively upon

a small map (Fig. III) giving the Korean names of the towns and districts with their English equivalents and the names of the provinces of the kingdom in which the places are situated. I was told repeatedly that the metal was most plentiful at Tan-chih-an, in the Han-kiang province. Concerning this locality our Korean geographer says, "at Ma-nu, west of Tan-chih-an, much gold is found. The mountains there are lofty and precipitous."

Fig. III



Sketch - Map of Korea  
Localities where gold has been found are marked.



## THE ORDNANCE SURVEY OF GREAT BRITAIN: ITS HISTORY AND OBJECT.

By JONATHAN PIERCE, J.A.

### I. THE INSTITUTION OF NATIONAL SURVEYS.

THE earliest surveys were not laid down as maps but consisted of catalogues of property which are called "terriers;" of these the Domesday Book is the earliest extant. Had the art of surveying been properly understood at the time of the Norman conquest there would probably have been a Saxon cadastre along with the Domesday Book, which was ordered by William the Conqueror in the year 1085.

"After this had the king a very large meeting, and a very deep consultation with his council about this land, how it was occupied, and by what sort of men. Then sent he his men all over England, into each shire, commissioning them to find out 'how many hundreds of hides were in the shire; what land the king himself had, and what stock upon the land, or what dues he ought to have by the year from the shire.' Also he commissioned them to record in writing, 'How much land his archbishops had, and his diocesan bishops, and his abbots, and his earls; and though I may be profane and tedious, what and how much each man had, who was the occupier of land in England, either in money or in stock, and how much money it was worth.' So very narrowly did he commission them to trace it out, that there was not a single hide nor a yard of land (the fourth part of an acre), nay, moreover, (it is shameful to tell, though he thought it no shame to do it) not even an ox, a cow, or a swine was there left, that was not set down in his writ, and all the recorded particulars were afterwards brought to him." *Domesday Chronicle, by Ingram.*

The publication of the Domesday Book was ordered first by George III. in 1763, and completed in 1783. After the discovery of the art of photolithography it was reproduced "in facsimile" in 1864-5, under the direction of Lieut.-Gen'l Sir Henry James, then Director of the Ordnance Survey.

Little change (in the art of mensuration or surveying) seems to have been made until the early part of the 16th century when simple boundary line maps accompanied the returns of the surveys made in Ireland in 1534, by order of Lord Stafford, then viceroy, and in 1540, by Sir Thomas Smith, when the king of Sweden by Gustavus Adolphus, which must have become known to Cromwell, for in 1654, the "Down Survey," as it was called, comprised maps of the townlands, and embraced over two-thirds of the surface of Ireland (about 20,000,000 of English acres).

It may not be uninteresting or irrelevant to bestow a few remarks upon the development and methods of surveying in the seventeenth century, many of which have descended with little modification to the present day.

When man first conceived the idea of owning real property the art of geometry or surveying became a necessity. Interest in other worlds than our own, and the measurement of time, led to the development of the science of astronomy, and of graduated instruments for measuring angles. Many of the most refined modern instruments are but slight modifications of original Arabian models, and the practice of linear surveying, or the subdivision of land into triangles, and geometrical figures, whose area could be computed, has been carried on without modification for centuries.

The greatest development took place after the introduction of artillery in the methods and instruments used for trigonometrical surveying or range finding. Every principle which is to-day known and applied in the construction and use of modern trigonometrical surveying instruments can be traced in a modified form to the construction and application of the instruments of the sixteenth and seventeenth centuries.

In the practice of artillery, the first important question is the distance or range of the enemy. As in war it was clearly impossible to obtain the same by direct linear measurement, instruments were devised for measuring the range trigonometrically, and based on the calculation of a single triangle, the base and two angles of which could be measured. These instruments were simply modified to the extent of furnishing in the instrument itself a constant base or angle so that only one or at most two measurements were necessary.

The one instrument that has received the greatest development in the modern type is the quadrant, a circle graduated arc from whose center was suspended a plumb-line, or which carried a movable arm with raised sights for measuring horizontal or inclined angles. This arm has retained the name *alidade* derived from the Arabic.

Such was the trigonometrical instrument used by the earliest navigators and astronomers for determining latitudes, and by surveyors and architects for fixing up ranges.

In the latter part of the 16th century Thomas Digges, surveyor and author, conceived the idea of combining two such graduated arcs in one instrument, the one placed horizontally and the other in a vertical plane, the whole supported on a rigid stand or tripod, and he called the same an *Universal Gun*, which is said by De Mezeriac to have been the origin of the name of the modern instrument.

In the earliest books on the practice of artillery and of surveying, the crux of the problem about a circle is the problems illustrating range finding or trigonometrical surveying generally floating over the tower of some captured castle or town, which it is desired to bombard. This clearly demonstrated that the chief use of trigonometrical instruments was for military purposes.

Among the instruments of surveying of this period which have no objection whatever to being used in the present century, but which is most widely used elsewhere, is the plane-table, unquestionably one of the earliest instruments invented for measuring or recording angles.

At the period 1570, when the Germans said that it was invented by Pictorius, a professor of the University of Nuremberg, it was unquestionably in use in England, and it is mentioned by Thomas Digges, in his *Polyometria*, published in 1600, as a plotting instrument for such as are ignorant of arithmetic calculations. In the relative merits of the theodolite and plane-table a century ago, it was

Throughout Europe great activity in the development of the practical applications of geometry soon followed the exchange of ideas brought about by the introduction of printing.

Side by side with the important geographical discoveries of the age came the rapid improvements in scientific instruments

which rendered them of service and prevented their being superseded at a later period.

With trifling modifications the instruments devised by Dürer, Newton, and Ghalles are in common use to-day.

Gradual improvements can be traced in the application of surveying to military and civil purposes, to mapping the campaigns of Louis XIV. and Marlborough, and laying down the forfeited estates in Ireland by William III., until in 1788 the first national survey on a large scale, for public and private purposes, was commenced in Savoy and Piedmont by Victor Amade II., wherein nine years were occupied.

The method of large surveys obtained the name of l'adastra (Terrier map). It was suggested for France in 1769, but was only commenced in that country in 1793. The exact derivation and meaning of the French term "cadastra" are not free from dispute. Some authorities refer it to the verb "cadrer" to square or correspond with, all objects on a large scale, plan, or cadastra being shown in their true position and proportions, whereas in a mere topographical map similar accuracy is impossible, and certain features must need be exaggerated for the sake of distinctness.

The *Dictionnaire des Dictionnaires* on the other hand derives *cadastra* (formerly *caplastra*) from the nonneval-latin word *capitastrum* (from *caput* "head," because formerly people were taxed, and afterwards property) and defines it as "a public register, containing the quantity and value of landed property, names of owners, etc., and which serves for the assessment of the tax on property." *Encyclopædie des Sciences*.

In the *Dictionnaire des Sciences* *Les sciences sur les contributions directes*, the *cadastra* is defined as "a plan from which the area of land may be computed, and from which its revenue may be valued."

Thus, there is no doubt, is the sense in which the word is used on the Continent, while in England it is taken as denoting generally a survey on a large scale.

It was not until long after the organization of the Ordnance Survey that it became a cadastral survey. Its organization at first was distinctly for military purposes, and the extension of its operations to cover all national needs only attained after years of discussion, and struggle for existence.



The credit of originating and carrying into execution the first tangible project for a systematic topographical survey of part of the kingdom is divided between two engineer officers, both at the time holding distinguished positions on the staff of the British army. The idea was a *seem to have followed close upon the sanguinary termination and adoption of the "forty-five" rebellion*, by which the fate of the house of Stuart was assumed, in the reign of George the Second.

It was doubtless the outcome of that unhappy rising for the contemplated a general map of the Scottish Highlands, precisely those parts of the country in which the heart and soul of the counter-revolutionary movement had at long centered. The difficulties of moving troops through these wild mountain districts, and without any clear knowledge of the passes connecting the glens and fastnesses, or of the correct distances intervening, would have been enormously lessened by the possession of good maps.

The survey of this wild and inaccessible region was undertaken in 1747 by Lieutenant-General Watson, an engineer, ably assisted by William Roy, who afterwards played a distinguished part in the earlier geodetic work of the Ordnance Survey.

The map, at first intended to be extended to the Highlands only, was at last extended to the Lowlands and thus made general in what related to the mainland of Scotland, the islands except some lesser ones near the coast, not having been surveyed.

It is spoken of by Lieutenant-General Watson, in his excellent book on the Geodetic Survey, as a "piece of work which appears to have been remarkably carried out as far as it went, qualified by

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The survey of Scotland was interrupted by the breaking out in 1745 of another of England's intermittent wars with France, that which gained her Canada, and the work was never completed.

"On the conclusion of the peace of 1763," writes General Roy, "it came for the first time up for the consideration of government to make a general survey of the whole island at the public cost." But, for reasons not assigned, the twelve years' interval of peace before the outbreak in 1775 of the American War of Independence was allowed to pass away without anything being done.

There the matter remained in abeyance until, after renewed hostilities with France and Spain, peace was restored.

The trigonometrical survey of Great Britain may be said to have been begun one hundred and six years ago.

Astronomers of that day were concerned at the difference or discrepancy between the Greenwich and Paris observatories, and it was ascertained by trigonometrical measurement; and in due time the astronomer-in-chief and of the Royal Society, Thomas Digby, Esq., in April, 1784, began the task by the measurement of

base line in London Heath which was to serve as the starting point of a series of triangles to be extended to Dover and across the channel.

This work was carried out in connection with the French revolution being established in 1793.

Soon after this the government ordered the carrying out of a general survey of the Kingdom of Great Britain.

For some time for military purposes, and the Royal trigonometrical survey in the south western counties became the basis of the Great Triangulation, which was gradually extended over the whole of the British Isles and finished in 1851.

The original survey was carried northward through England and Wales and for the successive superintendence of artillery and engineer officers, and by 1824 had reached the northern borders of Yorkshire and Lancashire.

At this time it became necessary that a survey of Ireland should be made on a large scale as a basis for general land valuation. On the recommendation of Colonel Colby, then Director, the sum of six hundred thousand was agreed upon, the work in England was suspended and the force transferred to Ireland.

It appears from a report of Colonel Colby, in 1840, that the purposes for which the English and Irish surveys were designed were gradually developed and not as originally known.

The principal triangulation, on which the survey of Great Britain had been based, was partly designed for astronomical purposes, partly for a map of small scale.

The triangulation was continued by officers of the Royal Engineers, partly for the purpose of promoting land in military training, and partly for the purpose of making maps for the use of the public.

The publication of some parts of this nation on the scale of one inch to one mile created a desire among the public to possess better maps than had formerly existed.

This led to the employment of civilian surveyors to observe the progress of the map, and it was found necessary at great additional expense, to revise and correct these on that point.

The work did not possess the accuracy commensurate by far with the naturally increasing importance of the coast surveys for the hydrographic survey of the entire coastline. As a military map its publication at this war was suspicious, and it could hardly be considered matter of doubt in terms of its use.

At the time the gentlemen of the adventure of Bathurst, re-  
 proposed to the government to proceed with the map of their  
 territory, & its regular parts, upon exhibition of their becoming  
 members for a certain number of copies. These gentlemen  
 partly wished for the map for their own use in hunting, and partly  
 for the improvement of the country in marking out the drainage  
 of the lands.

They also existed, which could be traced back to the Norman Conquest. Thomas Bay Survey—against the right of a surveyor to a proprietor's plot, which the early coroners paid for the right to do as the surveyor lay out of the survey of the lower stratum, to obviate the inconvenience of trespassing and to save the owner's trouble.

There were some of the increased delay, expense and institutionalized system to be further work.

[illegible]

The House of Commons passed a report stating its principal object, providing a legal vehicle for increasing the tax powers which were to be exercised, granting the necessary powers to the House for the purposes of the survey, and providing for the removal of tax of public land.

The earliest models of mobility algorithms were a bit crude, with new nodes joining the system without being assigned a specific role.

It is important to note that the organization of the Irish survey marked an important step in the history of the survey series, for its change from a topographic to a general survey.

In Ireland, as is due to the pale shales, there is no indication of similar deformation related to the thrusts, which are very frequently, but not uniformly, contemporaneous with the post-thrust

The townland was the lowest unit of taxation for country parishes, of an average size of 20 or 100 acres, and originally the map was to be simply a topographic map, containing the boundaries of the townlands, the roads, the streams and the houses, with a view to the valuation of Ireland for the county assessment. The six-inch was considered to be the smallest scale that could be available for that purpose.

There was no intention in the original Irish survey to insert the fields, but when the valuation began, it was found by the valuers that additional minuteness was necessary to enable them to subdivide the townlands into the quantities of lands of which they consisted, and more especially that the boundary between the cultivated and uncultivated portions ought to be inserted on the maps with great accuracy.

This rendered necessary a very extensive revision which was undertaken in 1860, and it became a survey by field instead of townlands.

This was clearly a wide and most important departure from the original intention of the six-inch survey in Ireland, and it is not to be doubted that General Forbes, who would not trust to paper measurements for the areas of entire townlands, would have adopted at the very outset, for the manuscript plans of these areas and divisions, a scale much larger than that of six inches to one mile.

The engraving of the six-inch survey appears to have resulted from a demand for six copies of one sheet for valuation purposes when it was found that it would be as cheap to engrave it as to make that number of copies.

So valuable did the six-inch map of Ireland prove for many purposes over and above that for which it had been originally designed, that, in 1846, when the Irish survey was completed, and that of England resumed, the Government gave their consent to the adoption of the same scale for the unsurveyed parts of Great Britain.

By 1851, Yorkshire, Lancashire, the Isle of Lewis, and several counties in the north of Scotland were finished on the six-inch scale.

Then began that long controversy which has been well termed the "battle of the scales" and which for eleven or twelve years retarded the progress of the survey and led to a large waste of public money.

During the time that the Ordnance Surveyors were engaged in making their six inch map of Lancashire and Yorkshire they were called upon and employed to make, at the expense of the proprietors, twenty-three plans of parishes and townships on the scale of two by six and  $\frac{1}{2}$  inch to one mile for tithe commutation.

It was very found that the plan of Lancaster was used by the Metropolitan Commissioners of Sewers, on the scale of six by eight and a half or five feet to one mile was used by the Commissioners to house drainage within the area.

Between 1851 and 1852 no fewer than three select committees and one royal commission deliberated on the scale for the survey, and fourteen blue books were presented to Parliament.

The main point of the controversy was whether the six inch or some larger scale was best fitted for the national map. A host of persons eminent in science were consulted on the subject, and a great diversity of opinion was found to exist, the weight of experience, however, inclining by a majority of four to one, to a scale of from 20 to 26 $\frac{1}{2}$  inches to a mile.

In 1855 a statistical conference held at Brussels and attended by twenty-six delegates from the chief States of Europe considered the question of national maps or cadastres, and pronounced unanimously in favor of a scale of  $\frac{1}{2}$  inch of nature equivalent to about 26 $\frac{1}{2}$  inches to a mile, recommending at the same time that the cadastre on this scale should be accompanied by a more general map on the scale of  $\frac{1}{6}$  inch equivalent to about six  $\frac{1}{2}$  inches to a mile, and thus very nearly corresponding to the six inch scale of the Ordnance Survey.

The scale finally adopted of  $\frac{1}{6}$  inch, on which the whole of England has at last been surveyed, is one which corresponds with that adopted for the national maps and plans of the chief countries for Europe. Lastly it possessed the incidental advantage that a square acre is to all practical intents represented on the plans by a square inch.

Among the many public purposes which the national map was expected to subserve are the following; the valuation of property for the equitable adjustment of taxation and assessment; the sale and transfer of land and the registration of title; railway and other civil engineering work, such as the construction of roads and canals, large sanitary and drainage schemes, military engineering works, hydrographical, geological, and mineral surveys; the

per annum, a considerable amount of waste paper, and of land for use.

For the statistical surveys, the soil is not made subject to the production of other publications carries on separately.

It has been amply proved on the sea-experiments that a man, with eyes, on a scale of something like twenty-five inches to an inch is the smallest which can properly fill all these require-

In the organization now existing in the Ordnance Survey it exists to-day, no pains are spared to secure the most perfect and economical use of the field work and of the

After more than a century of development and the completion of the cadastral map, let it not be supposed that the mission is at an end, for it is proposed to make a complete revision of the cadastral work at least once every twenty years.

This is rendered necessary by the constant changes in property boundaries, and the growth of population which may be gathered from the fact that the city of London increases its population at the rate of about 1/1000 a year and that eighty or more miles of new streets are added in the same time.

## II

The Ordnance Survey of Great Britain as it exists to-day is a remarkable Field-working Bureau, from whose presses are given the most accurate and accurate series of maps which any country possesses.

Maps not alone confined to the representation of the physical features of the country, but containing every detail of interest or value for civil or military purposes.

It has justly gained the comment of the French that it is "a work which a precedent, no longer to be taken as a model by a civilized nation."

The principal series of publications issued by the Ordnance Survey are—(1) A general map on the scale of one mile to one inch. (2) County plans on the scale of six inches to one mile. (3) Cadastral or Parish plans of the whole country on the scale of  $\frac{1}{1000}$  or about 264 inches to one mile, on which one square inch on the plan represents an area of one acre. (4) For towns of over 4000 inhabitants a scale of  $\frac{1}{1600}$  of actual length on the ground or 1044 feet to one mile.



the exact scale of the general map. It needs but little imagination to foresee that houses would be mere specks, roads, faint lines, and forests, masses of white, or other worse, but it would be more instructive to consult the general map, on which all details are magnified to be clearly visible and topographic features brought out with great distinctness than to attempt to trace with unaided eye, from the image of objects at a distance of twenty-four miles, the course of streams or roads through forest or tabor, or to judge of the relative elevations or modeling of the ground from the values of light and shade. Without an intimate local knowledge of the country there would be nothing to indicate the name or boundaries of villages, or estates or the political and other subdivisions of the land, which are most clearly indicated on the map, in unmistakable strokes of lettering.

Another and more serious problem which would be suggested as the balloon receded from the earth would be the distortion or perspective produced by the irregularities of the surface. The higher points being nearer the balloon would appear in the image on larger scale than the lower, and only in the case of a perfectly level country, would it be possible to produce a map without distortion by the method proposed, and then only for a limited area.

As the balloon receded, the relative differences of elevation would bear a smaller and smaller proportion or ratio to the distance, in other words, the distortion would grow less until at an infinite distance it might be neglected.

We might conceive that the observer was stationed at an extremely great distance, and provided with a series of magnifying lenses of suitable powers to produce maps of any desired scale; yet, beyond a limited area, he would still be confronted with the problem of eliminating the distortion produced by the curvature of the earth.

Such is the conception of an accurate map which is an attempt to produce on a plain surface or sheet of paper, a horizontal projection of objects on the ground, which will show the relative positions of every detail or any desired scale with as little distortion as possible, and on which distances may be measured in any direction, and areas computed with a degree of accuracy only limited by the scale.

When a survey of a small area is made, such as an estate or parish, which bears but a small proportion in area to the surface



of the earth, curvature is neglected, distortion due to this cause being imperceptible, but in the survey of a large country it is of primary importance.

Returning to the conception of an observer stationed at an infinite distance his position with reference to the new general one-inch map of England and Wales would be in the plane of a meridian passing through Delamere in Cheshire, and the published quarter sheets would be a series of rectangles each 18 miles by 12 miles, containing an area of 216 square miles whose edges were parallel to, and at right angles to the central meridian.

Those of Scotland and Ireland have for each country a central meridian and projection.

In viewing the county maps of six inches to one mile and larger scales, it would be necessary to assume that the observer was stationed over the center of each county except that where two or three counties lie so well north and south of one another, the same meridian serves for more than one.

In the reproduction by photography of the maps on the same of one mile to one inch from those of larger scale, these facts, that different planes of projection are used for the latter, have to be taken into consideration.

In countries of larger areas than England it is more customary to assume a central meridian for each sheet, in other words, the observer would be stationed in the center of the center of each sheet and would sketch but a small area. The successive planes of projection, represented by the maps, would resemble the facets of a diamond, and it would be impossible to combine with any degree of precision a large number together in one plane surface. On the other hand, the whole of the one-inch series of England and Wales of Scotland or Ireland register perfectly, and the distortion due to curvature cannot be great, as the total area of the three countries bears but a small ratio to the whole surface of the globe.

A caution has been called to the fact that viewed from a distance an ordinary sunlight the minor features of topography become flattened and indistinct.

If, therefore, we regard a sheet of the one-inch map held at a distance of two feet from the eye as the picture of a country seen at the distance of twenty-four miles, we see that details, that would be invisible from above, are brought out with great distinctness on the map and every detail of topography is shown

a bold relief. In other words the map is a diagram rather than a picture.

In the representation of relief on the one inch series, two systems are common, contours and hachures. Contours represent the successive shore lines which water at rest would form in following the moulding of the ground at successive stages of elevation. If now we assume that the water, having reached the highest point, is allowed to retreat steadily to sea level, the paths which the particles of water would take from all parts of the surface are those which the engineer would endeavor to reproduce in the shape lines of a hachured map. In addition he would adopt a relative scale of shade increasing with the steepness of the slopes, from white on a horizontal surface to dead black on slopes of forty-five degrees, or greater, to produce the effect of a model of the surface.

In the best maps this effect is better and more artistic, a discrimination from the north-east pattern having been carried. The shade lines still preserve the paths of particles of water motion on the surface, the color values being deeper on the eastern and southern slopes, and have even been projected across valleys and horizontal surfaces are in half tone, producing much the same effect as the representation of the country at sea level by a diorama.

The best maps executed are considered the best specimens of colored hachuring and will bear critical examination. For comparison with these, other topographical maps are exhibited of nearly equal scale and countries.

So far a tent on this subject has been drawn to a few of the problems of map making, which are, briefly:

- 1st. The representation of a flat or sea level as a plain surface of the natural features of the terrain, without the artificial boundaries and objects added by man, so far as the scale permits.
- 2d. The extension of such a series of maps to cover a large area of country and carried out with as little distortion as possible.
- 3d. The reproduction of such maps on suitable scales to meet all demands.

If the conception is still carried out that the map, at a distance of two feet, is but the image of the ground viewed from above, then the cartographical map of England, from which areas of fields and estates are measured, for various purposes, would represent

a view of the country from above at a range of 5,000 feet or nearly one mile, and a town plan, an image at 1,000 feet or a possible view from a series of half-towers.

This suggestion of an observer stationed in a balloon, will not have been useless if it draws attention to the fact that vastly more information is given on the map than it would be possible for any single observer to discover from an elevated station with an unobstructed view the map being the compilation of the results of hundreds of observations by many workers, and that its scale and the amount and character of the detail shown have been specially designed to meet definite ends.

It is beyond the limits of the paper to enter into the theory or practice of surveying, or to say more than a few words of the elaborate and refined operations necessary to carrying out the geodetic or trigonometrical work of a national survey which can be regarded for many parts to make a complete whole.

The principal triangulation of the British Isles was begun in 1784 and finished in 1832. Two magnificent 9-foot theodolites made by Ramsden, one for the Royal Society, the other for the Master General of the Ordnance, an 18-inch theodolite also by Ramsden, and 2 feet theodolite by Troughton and Surme were used in these observations.

In the principal triangulation of Great Britain and Ireland there are 214 stations, at 16 of which there are no observations, the number of observed bearings is 1854—and the number of equations of condition

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through the kingdom was a volume of 100 volumes of books, and a preserving a most advantageous number of equations of condition.

The observations, all in duplicate, were completed in two years and a half, an average of eight computers being employed. Many of the sides of the principal or primary triangulation are of great length, 60 of them exceeding 50 miles, while 14 measure more than 100 miles, the longest being 141 miles, that from Sea Pelt to Short Donard. So great, however, has been the accuracy

of the surveyors work, that the average amount of correction of the observed angles was not more than 0.4, and the measured length of the secondary base differed from its length as computed from the Triangulation, 35 miles distant, by a difference of only five inches.

The secondary triangulation interpolates points at shorter distances apart ranging down to five miles, the observations being made with theodolites of 12-inch circle. These triangles again are broken up into smaller ones of sides from one to two miles in length, for the use of the surveyor who is to follow and measure between the stations with the chain; and a further subdivision of the trigonal spaces is made in towns to points about 10 chains apart, where the survey is to be made on the very large special scale. In the two last cases, 7-inch instruments suffice for the measurements.

#### LEVELLING

From 1830 to 1855, lines of initial levelling extending all over England, Scotland and Ireland were run, and the observed altitudes of the bench marks were reduced by the method of least squares.

In England and Scotland, these levels are based on the Ordnance Datum at Liverpool, which is approximately the mean low level of that place; in Ireland, they are based on the low water level at Dublin, which is about 6 feet below the mean level round the coast of Ireland.

The detail levelling is carried out contemporaneously with the progress of the industrial survey. Starting from the marks on the initial series, lines are run along nearly all the turnpikes and parish roads, and bench marks set at intervals of about a quarter of a mile.

The whole of the bench marks of the initial levelling are shown in position on the 25-inch manuscript plans, and their heights given to the nearest tenth of a foot. Surface heights, to the nearest foot, are also marked on the plans, at frequent intervals between the bench marks.

#### CONTINUITY

Contrary to the custom in other countries, the contours of the English survey have all been surveyed and levelled on the ground, checked by the numerous bench marks, the standard of accuracy demanded in levelling being two-tenths of a foot.

Owing to the expense of the process, about \$1.25 per actual mile, only the 100-foot contour lines have been surveyed, except where greater detail is required for military purposes, which information is not furnished to the public.

OF THE SURVEY.

The first features for the one inch maps are first sketched in the field by the military method of slopes and sketch contours or profile impressions of the surveyed sheet.

Finished drawings from the field sketches are then made on cardboard impressions from the one inch outline plates, and pushed as guides for the engraver to work by.

Beautiful and delicate in finish as is all the work of the copper plate engravers on the Ordnance Survey, there is perhaps a branch in which they so peculiarly excel as in their delineation of hills on the one inch maps.

III.

It is impossible in the limits of a single paper to attempt to describe the methods and processes of publication which are carried at the headquarters of the Ordnance Survey at Southampton.

Thoroughly prepared treatises on the subject have been written by officers engaged in the work, and for clear and concise description none are better than the series of articles by Captain H. Skey, R. E., published in *Engineering*, in 1888.

There are two points of great interest in connection with the Ordnance Survey which cannot be neglected. The one is military organization, and the other the economy of its methods of publication.

Of its military organization, which has continued since the first surveys were made for military purposes, it may be said that the conservative precision of its methods of field work are best adapted for military control and discipline. Under the successive superintendence of highly educated officers of the Royal Engineer Corps, whose patriotic efforts have been to secure efficiency and economy in the service, the country has greatly profited.

Many of the improvements and inventions that have made possible the publication of maps of all scales at the lowest possible cost, are the results of experiments made by these officers.

It should not be forgotten in addition that as a branch of the War Office and the Publishing Department of the Intelligence Branch, military supervision is essential. Its officers are therefore not open for public inspection except on proper introduction.



# GEOGRAPHIC NOMENCLATURE

REMARKS BY DELEGATE J. QUINN, GUSTAVE HERMIE, MARCUS BAKER,  
AND A. F. JOHNSON

MR. QUINN: It was expected that Professor Menzies would be with us this evening to address the society on the subject of Geographical Nomenclature, but he is unavoidably absent having been called to Philadelphia, and has ~~re-~~  
presented him, and present to you an apology for his absence.

Professor Menzies has been greatly interested in this question since he became in charge of the Coast and Geodetic Survey. Questions of cartography and nomenclature have been before him in a practical way, and the variety of views expressed as to his inquiries confirmed him in the opinion that the subject was serious, and that it was of necessity to be taken in great many cases for publications which were being made. Really a large part relating to Alaska came from the Hydrographic Office, which

and I met in Washington that were interested in this matter, and that were making maps, charts and other publications regarding geographical names. It is too true that the different bureaus are now not giving the same names and in different ways, sometimes different names for the same place, and the same name for different places; indeed the confusion is so great you may even read publications relating to the same locality and at first not realize the fact.

The object that Professor Menzies had in view in organizing a board was to secure uniformity; that is, to get some together, and to set with a question arose between different bureaus it might be referred to this board to settle, with the concurrence of all. Such a board would also secure stability, as the bureaus would not dare to make changes in names that had been accepted, as may now be the case when a bureau falls under new management, or the determination of the question is referred to new officers without experience. This board, as proposed, was to be formed by representatives from the Hydrographic Office, Smithsonian Institution, War Department, Geodetic Survey, Coast and Geodetic Survey, Light-house board, The National Geographic Society, Post Office Department, and the General

Land Office. All these bureaus or departments gave tacit assent except the Post Office Department and the General Land Office, but we may hope that these departments will eventually be represented, when the practical usefulness of the board has been demonstrated by its career.

There are three, perhaps four classes of cases that cause the most trouble in geographic names. In the first class, those cases where we are certain of the name itself—that is, we agree in the pronunciation, but disagree in the orthography, in the second class, where there is no question as to the orthography, but where there is a question as to what name should be used—that is, several names are given to the same point, to the same body of water, or to the same island; in the third class, where there is no question as to the name or the orthography, but a question as to the name to which the name applies—that is, there is no dispute as to the name, but it is applied to different places; this class is sometimes exemplified by questions as to the geographical position which a name applies—that is to say, the area to be indicated by the name; for instance, some body of water or a range of mountains, and may be designated a fourth class.

To cite a few instances of these classes—we have the question of Wood's "Hole" and Wood's "Holl;" for many years it was called Wood's Hole, recently it would seem to be the pronunciation of the name that has prevailed, and Wood's Hole, we formerly had "Hull" for "Holl;"—I have called "Princess" Bay, the error arising, I suppose, from the pronunciation; we also have "Rody's" Island or "Roches" Island;—we have a peculiar case on the North Carolina coast—"Pamlico" Sound has generally been used, now we have "Pamlico" Sound, authorized by the State legislature; on the coast of Virginia we have the case of "Metunkin," which has frequently been written "Metompkin" and "Matunkin;"—in California we have Point Conception, whether it should be spelled with the "c," or with the "t," in the last syllable, we also have "Point Beneta" or "Beneta," which may also be spelled with one "n" or two ("nn"); Coos Bay, with "k" or "c;" this name, I understand is sometimes pronounced "Co-os," as though it had two syllables; if the spelling of this name was governed by the rules of the Royal Geographical Society the "K" would be used for the hard "C," but "Coos" has been adopted by the State legislature and will probably be retained.



One of the most singular perverseness is found in "Herring Bay ; the explorer wrote his name "Hering," and yet we find it is customary, almost everywhere, to spell it "Hehring."

In the second class of cases, where we have different names for the same place, we may cite Higgs Island, at the entrance to Portland harbor ; an effort was made not long ago to change this name on the Coast Survey charts to Cushing's Island, the evidence was so strong that an order was issued to effect the change, when the supporters of "Higgs" produced substantial evidence and secured the retention of that name. On the coast of Florida we had two Saint Joseph's Bays, and a comparatively modern name, "Anchore Anchorage," was presented to take the place of a part of one of them, which led to designating the rest of the bay "Saint Joseph's Sound," Sound being more appropriate for the locality. We have also some other instances on the Florida coast, as "Cape Oxford" or "Hansen," "Cape Gregory" or "Amey," "South Barataria" or "Southeast Barataria," and in Alaska there are instances too numerous to mention.

In the third class of cases, the locality to which the name applies, we may cite "Bloody Point" Bay and "East Penobscot" Bay, on the coast of Maine, "Hempstead" bay, on the coast of Long Island, a bay which is almost filled with small islands, rendering it most difficult to satisfactorily define its limits ; "Asateague" bay, on the Jersey coast, is an instance of growth ; it was at one time called "Asateague," and although "Asateague" was retained for many years as applicable to the upper part of the bay, it has finally been restricted to the lower part in Asateague Island. On the Pacific coast there are a great many instances, possibly one of the most difficult relates to the limits of Admiralty Inlet, how far it extends into Puget sound ? Again, to the northward, is what for years has been called "Washington" Sound, an effort is being made to change it to "Possession" Sound, the latter name, I believe, was once applied to a portion of the sea, perhaps we shall even now see both names on the chart. The difficulty of defining the limits to which a name applies may be exemplified in dealing with "Hampton Roads," or "Tybee Roads ;" apparently simple problems, but who will undertake to define the exact limits of these famous roadsteads ?

These questions, even when stated in their simplest form, are oftentimes very complex, for several of the general classes I have

referred to may be introduced in its position, and when we attempt to determine that which is best they become very perplexing. In seeking advice we are not with a variety of views; we are with individuals who we cannot take into consideration guided by the Government, some preferences that have been recognized independent of Government; some who adhere to some ideas, while others prefer to be conventional, and expressive as in general use. The experts are very prone to hunting out the roots, or, if necessary, to exterminating or, at least, taking out everything that will not conform with it. The fact that our country was settled by French, Spanish, and English, and that many names are derived from the various sources, also causes peculiar difficulties in treating some matter. The plans of the Lloyd Geographical Society can be a great help, so far as they are applicable; they seem to have been used in the Government's policy of "link up"—at the time of war we used "his honor" some years ago, it was spelled "Hispania," but in the name of the States recently admitted to the Union, "his" has been so construed for the hard "c" and the final "h" has been dropped. There is now great disagreement as to the propriety of the use of the possessive case; some would not admit it at all, others would like to drop the apostrophe as I retain the "s" in

to which is a question that requires special consideration. Some of the possessive we sometimes give the name a descriptive meaning not at all applicable to the locality or feature. The propriety of personal names is also a question that has led to continued discussion in Alaskan nomenclature, where explorers and surveyors have been so inclined to bestow new names on the same place. It would seem to be a good rule in selecting a new name to follow the old Indian custom of describing the place. An opportunity for an extensive comparative seems to have been lost in the haste used in transferring so many of our cash names instead of selecting new names from the rich native vocabulary.

As different bureaus may be governed by different principles, and may not even be consistent in their own rulings, though new principles must may come in by the frequent change of personnel. As heretofore been impracticable to secure uniformity, and disputed questions have been carried along for years. The bureau that has been organized is in the direction of developing uniformity in the practice of all. It is no easy task, but if guided by a generous spirit willing to yield a little here and there, its object may be successfully accomplished.

It is not for us to say to what extent the Senate will be influenced upon it, as no power to take the initiative; but we hope its proposals will prove acceptable, that it may establish a reputation that will be recognized by the people as well as by the Department interested in its organization; and that eventually there may be recommended for the improvement of our own country that may be an acceptable model.

We are, Sir, very respectfully, Sir, your obedient servant,

Yours truly,  
 A. VON SIEBOLD.

geographical nomenclature—a large part of the world cannot fail to appreciate the difficulties in the way of the establishment of a comprehensive and uniform system of writing geographical names, that would be acceptable to all nations using the Roman alphabet in their literature. But while some advance towards international uniformity has been made within the last five years, we are still very far from it; we may, however, at least replace in the prospect of the general adoption of a uniform system in geographical orthography which writing has long shewn ago.

I refer to the action of the British Hydrographic Office and of the Royal Geographical Society in 1856, when they adopted certain *main* principles to guide the orthography of geographical names, and thereby took an important and far-reaching step in the line of a reform which had already been too long delayed.

In France a reform in geographical nomenclature had been earnestly agitated by Kéroul and de Lanza since 1830, and soon after the publication of the system adopted by the Royal Geographical Society, the Société de Géographie appointed a commission which, in 1859, reported a system for the guidance of French geographers.

In Germany, we also find similar attempts made (Lepsius, Kirchhoff, Ewald and others) to bring system into the orthography and pronunciation of geographical names, primarily with a view to secure uniformity in text-books and in the teaching of geography in schools.

No doubt influenced by the action of the British and French geographical societies the Imperial German Hydrographic Office in 1858 also established rules for guidance in its future publications.

We thus see three of the principal nations of Europe inaugurate a reform, the beneficial effects of which will not, however, become apparent until a sufficient time has elapsed, that is, until



corruptions. And lessen the number of exceptions in those foreign names which are readily understood when written in accordance with the adopted phonetic rules: as *Kalkutta* for *Calcutta*, *Mekka* for *Meca*, *Kutch* for *Cutch*, *Solebes* for *Celebes*, *Bonni* for *Bonny*, etc.

Another point of agreement in the British, French and German Hydrographic Office systems is found in their declarations in regard to diacritical marks in the writing of foreign geographic names. The British say that a system which would attempt to represent the more delicate inflections of sound and accent would become so complicated as to defeat itself. They therefore recommend only the use of the acute accent to denote the syllable on which stress should be laid. The German Hydrographic Office has adopted the same view. The French Commission in its deliberations expressed decided opposition to the adoption of *expansif* or any similar system, and finally adopted besides the "*tilde*" and "*cedilla*," only the accent "*circumflex*" and the "*apostrophe*," signs of which the two last are ordinarily employed in the writing of the French language. "In our country," the French commission says, "a native of the Normandy and one of the Provence do not employ exactly the same sounds in pronouncing, for instance, *Marseille*, *Anglois*, or *Montreuil*, and, in foreign lands, we find still greater diversity in this respect." Therefore, we should use diacritical marks with the greatest economy, and only when they are indispensable.

It is of course not to be expected that a certain school of geographers, who are in favor of the strict application to geographic names of a simplified form of Latham's standard alphabet, will be moved in this view, but it is to be hoped that all practical or led geographers will agree to reserve the extended use of diacritical alphabets for purely linguistic literature only.

In the meanwhile, the United States has not been idle, and the Hydrographer, Captain Henry F. Pickens, U. S. N., has taken the initiative by the appointment of a board of officers to examine and report a system of orthography for foreign geographic names to be adopted in the compilation of the Hydrographic Office charts, sailing directions and notices to mariners, which as we know cover all parts of the world.

The Hydrographic Office, by its daily experience with the subject matter, is especially fitted to inaugurate a reform, and it is hoped that the board, profiting by what the British, French

and Verina have already done, who report rules that may become generally satisfactory to American geographers.

In our own country the territory of Alaska needs special attention in regard to settling the orthography of its geographical names of Russian origin. It is a subject on which there is a lack of a highest in geographic authority, since no great number of them appear in different forms. The difficulties of transcribing Russian names so as to reproduce the correct pronunciation are well enough understood. In the first place the Russian alphabet contains 33 letters, of which 12 are vowels and 21 are consonants, 9 are semi-vowels, and the balance, consonants. In the alphabet, there are 26 consonants which have no exact equivalents in the English alphabet and on the other hand, there are 4 English consonants (*j, w, x* and *z*) not represented in the Russian alphabet. Hence, whatever system is employed, we can only hope to give the pronunciation approximately. Many of the Russian names found to-day on English and American maps are probably wrong, by the way in which they are rendered, on the absence of knowledge of the grammatical construction of Russian on the part of those who originally transcribed them. There are few other languages in which case and gender play such an important part in the formation of proper names as in the great Slavonic idiom. Any one not conversant with the Russian declensions should not, therefore, attempt to transcribe Russian geographical names into English as he will be sure to err. On Russian maps, for instance, Behring Strait reads "Beringsoy Proye" Behring Sea, "Beringsoy More?" Kamchatka Bay "Zaoy Kamchatski," Horn, Island, "Rogovaya Zemlya."

By the by, I cannot exactly understand why the spelling of the name of Behring's sound, within the last few years, have been changed on American and English maps to Bering. The originator of this name, Vit Bering, was a native of Denmark, the servant of Russia, and it is safe to say that his name contained the letter *h*. Naturally in transcribing his name into Russian, the *h* had to drop out, as that letter is missing in the Russian alphabet.

The *h* was introduced by the English, and it is not surprising, I think, that it should be so. The name of Vit Bering, as given by Vit Bering, was a ready-made word for English ears. As a name representing a name of such a well-known personage, it is generally to be desired that English should

\* February 1890.

general principles adopted by the Royal Geographical Society, by a simple declaration in regard to the practical points by which, mainly for the purpose of facilitating correct re-transliteration of Russian names, the vowels *i*, *ä*, *ü*, *e* and *ë* and the silent *sch* vowels are sought to be distinguished in the written names. For the benefit of those unacquainted with the system of transliterating Russian, published in *Notes*, it is repeated at the close of this paper.

A few words more in regard to the treatment of the Russian geographical names found in Alaska. This territory will in the course of time contain a large English-speaking population, and its geographical names of Russian and Eskimo origin should, in a worldly sense, no longer be treated by us under the category of foreign names.

The future official orthography of Alaska might, therefore, be treated, I submit, that is to say, re-phoned or spelling following from a strict transliteration, might be simplified to a certain extent, as has been done with the spelling of many a foreign human name.

Of the geographical nomenclature of Asiatic countries none has become so rapidly well known as that of the Japan Archipelago, and we can already now class Japan among the countries having an official orthography.

Within less than twenty years the Japanese Government have established a geographical service for the survey of their mainland, and a hydrographic service for the survey of their coast and their great waters. They have now published several hundred nautical charts, which are as good and probably as well published by either nation.

In these Japanese charts, which are based exclusively on their own surveys, the names are printed in the signs of the "Kana" with the transliteration of the name in Roman characters attached. It is this feature which has practically secured us to a better and correct knowledge of their geographical names. Within the last few years the *Kanaga Kana*\* has made considerable progress, and the *Kanaga Kana* system forms already part of the official orthography of Japan. Here, we may

\* Society for the introduction of the Roman character for writing the Japanese language.

look forward to the day when Japanese books printed in Roman characters will supersede, to a large extent, the books in the signs of the 'Kana'.

One of the best authorities for writing and pronouncing the names of the districts, cities, towns and villages of Japan is a very recent publication\* by our honored countryman, Mr. W. N. Whitney, interpreter at the U. S. Legation at Tokyo, who compiled this admirable book with great care and labor from the official records of the Japanese empire. It not only contains the names in the original Japanese print, but what is of chief value to us, also the transcriptions, in accordance with the *Romaji Kana* system. We cannot do better, at present, than to follow this book in determining the orthography of geographic names in Japan.

It is not so satisfactory a state as the orthography of Japanese geographic names as that of the countries adjacent to Japan. Considering that Asiatic names have been transcribed phonetically by explorers and surveyors of different nationalities, at different periods of time, and who were often but little, or not at all, acquainted with the languages they had to deal with, it is not surprising that many of the names we find on the charts should have been written utterly wrong. That such was the case on even comparatively recent surveys is, for instance, illustrated by the change in the roman letters on the French plan of Cape Hoan Lan, in the Gulf of Tongking (Plan No. 3791). In the French survey of 1878 the same names on the editions of 1878 and 1880, respectively, are rendered thus:

1878	1880
Cap Cua-Lan.	Cap Hoan Lang
Dei-sa-uitao.	Cai-pui-tao.
Ie Sam-Lai-Tou.	Siang-Lai-Tao.
He Lam-Sam.	Lai Tao
He Foum-Lang	He Fong Wang

Such differences in spelling, as I have given of pleonasm, as are indicated by these names, are found on the charts of all nations, but, under the beneficial working of the systems adopted by the British, French and German, similar errors are rapidly being corrected, and progress is being made towards international uniformity in the spelling of all geographic names.

\* A concise Dictionary of the principal words, chief-towns and villages of Japan, with populations, post-offices, &c.; together with lists of *Kan*, *Kori*, and *Kudonga*. By W. N. Whitney, M. A., Interpreter of the U. S. Legation, Tokyo.



owing to the number of languages and alphabets in use in the vast empire, the orthography of its geographical names has for a long time been a matter of great difficulty. As we see from the "Hertfordshire Gazetteer," the Royal Geographical Society has decided to spell the names of places in the "Hertfordshire Gazetteer" in accordance with the pronunciation which, in view of the fact that the spelling in the Gazetteer is not always in harmony with the adopted rules, is more correct. But we can at the same time understand the difficulties of the situation, and appreciate the strong love of the English for old forms and long usage. The differences between the system and the Gazetteer are, however, not too great, since the essential vowel system is followed, and, it would be just as easy to write Ka-katin, Katch, etc., for Chakatin, Chatch, etc., as it is to write Korea for Chien, and thus be consistent with the rule.

Geographical names in Malay and its branches we know mainly through Dutch, British and Spanish surveys, and their status may be judged from the prefatory remarks in Maxwell's grammar

Malay, published in 1882, wherein he says, that the spelling of Malay words of the native character is hardly yet fixed, though the Permo-Arabic alphabet has been in use since the 15th century, and that those *gilden but een klein schiedje* who seek to preserve exact copies of spelling words, regarding which even native authorities are not agreed, and of which the pronunciation may vary according to locality.

In the charts published by the Batavian Hydrographic Office the Malay names are spelled in accordance with the Dutch phonetic system of transcription, so that the sound of *g* is always *har* (*h*) and as this differs from the British phonetic system in several particulars, it is clear that certain corrections must be applied to the spelling of "foreign" Malay names to facilitate the approximate correct pronunciation of such names by English speaking people. But a source of trouble is the seeming uncertainty of the Batavian geographers themselves as regard the orthography of many names, since it is a frequent occurrence to find the same name variously rendered on charts, or in sailing directions issued at short intervals of time.

We can see, from what has been said above, that chances for disagreement in the rendering of geographic names, originating in countries that do not use the Roman alphabet for their literature, are numerous, and hence, the occurrence of errors in the application of a new system about to be so largely con-

beamed, nor would the culprits deserve to be dealt with according to the law laid down by the municipal council of the good old Swiss town of Küssnacht, which not very long ago issued a decree that the *finest* in the name of their town should be dropped in all official communications, and that any local official failing to obey this decree should be fined.

MR. BAKER: In the preparation of a map, the last things to go on are the names. If the map covers a region of country long known or thickly settled most of its features already have names. A comparison of several maps of, or writings about, a region almost invariably reveals confusion, contradictions and errors in the names. The same feature often bears different names on different maps. The same name has various spellings, and the names on the map may in their turn not agree with local usage. Examples of this abound in most of everywhere, and are a source of constant perplexity to the geographer.

The names are often misapplied. The name of one cape or mountain peak through accident, carelessness, ignorance, or by intent is often found attached to some other cape or mountain peak. A small feature's name may be extended to cover much more than that to which it fittingly belongs, or a name rightly applicable to a large tract may be wrongly restricted to a small one. In the hands of the map-maker geographers' names may be regarded as labels loosely attached and easily misplaced. Handed on by many writers, both careful and careless, these labels become misplaced or lost; and in replacing these misplaced labels or in restoring lost ones much confusion and many errors arise. The newspaper writer writing hurriedly, the magazine writer without care, or the book writer working deliberately, each in turn finds that the investigation of questions relating to geographic names carries him away from his subject. If a question arises respecting a non-geographic term the dictionary can be consulted to find right or wrong, followed, without delay, by the word man. In most of the questions about geographic names, in the United States at least, we have no adequate dictionary or "authority" to appeal to. As a consequence in most cases the writer takes indifferently what is nearest to mind or hand and thus produces new variations in names, variants upon old ones or quite new ones. Such names are called corrupt or trisecans and finally, partly removed the stigma and the corrupted name having grown respectable is adopted.

A foreign name may be transliterated by one writer and translated by another. This process gives rise to two or more forms. The absence of uniform usage in transliteration causes diversity in one case, and in the other no uniform transliterations are possible and mistakes probably in various forms arise.

The progress of all sciences is intimately associated with a quickness of nomenclature. Modern progress in biological sciences dates from the adoption of the binomial system, and it is not too much to expect that progress in geographic science will similarly be found to be intimately associated with a study of geographical names and the principles which should control their adoption and use.

The object aimed at by these notes is to draw attention to the importance of the subject and to arouse discussion, the purpose of the discussion being to ascertain if there be not certain principles which we might serve to aid in solving the numerous and perplexing questions relating to geographical nomenclature.

What is a geographic name? Without adopting a ready-made answer to this question I would say that geographic names seem to me to bear a strong resemblance to the names used in biology. They are generic and specific. To designate any specific geographic feature we usually use two words, one a descriptive term, such as river, island, lake, pond or mountain, and the other, a specific name indicating what particular pond, lake, or mountain is designated. The term Mississippi River is a compound name, in which river may be regarded as a part of a proper name. It is the name of a genus, whereas the term Mississippi is the specific designation. Of course it will happen in geographic names, as in biology, that certain features or objects heretofore unknown that a single name, either the generic or the specific word, may usually need to designate the object. We speak of Maine without prefixing the generic term "State of," the specific name being sufficiently characteristic. On the other hand here I will give an example of the use of the generic term "River" in a compound name.

St. Lawrence River. The word "River" is used here for particular specification. These exceptional usages, however, do not appear to me to invalidate the general principle that the designation of geographic features consists in general of a specific and of a generic name.

The origin of generic terms has been much studied. The origin of specific names has been studied but little and the present

notes relate chiefly to this class. Special names may be said to have two distinct origins, *first*, those of formal origin where the name has been given *pro forma* and published in a book or map relating to the region by its discoverer, or by the earliest explorer. This covers the case for a small body of names. *Second*, there is a very large body of names which appear to have arisen without such formal origin, and to have, as it were, grown up by common consent in the usage of the people of the region.

That which it seems profitable to discuss here, and now, is the principles which should be adopted and followed in the selection of the names which are to go upon the map; principles which will enable one to discriminate when usage is divided, between that which should be adopted and that which should be rejected.

*First*, a few instances of the peculiar questions which arise, and then some of the guiding principles stated which it might be possible to adopt and to follow.

The river which flows along the western edge of New York City is locally known as the North River. Shall this be called the North River, or Hudson River, or Hudson's River? And if this geographic name is printed in the text of a book, will you print river with a capital letter or a small letter? It must be borne in mind that this question is asked not for the purpose of immediate or categorical answer, but for the purpose of eliciting thought and discussion upon the principles which should control the answer.

In 1793 Vancouver entered and mapped Port Townsend, which was formally named Port Townsend. At the present time the city situated upon that harbor, as well as the harbor itself, is universally known as Port Townsend, the "d" in the original being omitted. This is a clear and specific case, where the name formally applied by the original explorer is now modified in its orthography by usage. What form of the name shall be adopted? The former or original name or the present modified name? And if the original name is to be adopted, shall we proceed similarly in all cases and go back to the original form?

In the case of names which have undergone transformations through ignorance or through usage, shall an attempt be made to restore the original orthography? Take the case in Massachusetts of the stream called Bois Brule, or burnt wood, and which has become to the usage of the residents in that part of the world Bob Roy. Shall we seek to restore the original form, or shall we conform to the local usage?

When the map was made at a distance of Cape Cod and hence, the extreme breadth of the bay was exaggerated. In the waters, he put a point as if it were a small island, and a number of later maps applied this name to the southernmost point of Cape Cod as Malabar, and so it stood for 100 years or more as Malabar and only even he ~~came~~ up a small island called Malabar. In the Coast Survey publications it is a locality called Malabar.

Again at the north shore of Martin's Vineyard is a place formerly known by the Indian word Kap-haggon. On the modern map is this place called New Haven. Shall we in this case adopt the practice of the practice and restore the earlier form? In the same locality are four small harbors, called by the natives *Hobbs*, namely Hobbs' Hole, Wood's Hole, Robinson's Hole, and Quick's Hole. In current usage, except among seamen, Hobbs' Hole has disappeared as it been replaced by Vineyard Haven. Wood's hole has been converted into Wood's Hole, though still pronounced and called while Robinson and Quick still remain Hobbs. In this case shall we attempt to be consistent or on a different basis? In the former?

In the vicinity of New Haven there is a well known point many years ago by Coast Survey parties, and entered in their records Hobbs Rock. Surveying parties last year in searching for this station inquired for information respecting it for some time. It is well known to all the people for many names so named as Peter's Rock, and this name is, years on the county atlas of New Haven published in 1850. It is also the name Hobbs Rock has found earlier publication on Coast Survey charts or in its reports, though I have not verified this suggestion. Is it reasonable that it has been so published, shall we now call it at all Hobbs Rock or Peter's Rock?

Albany County, New York, is spelled Albany. A post office in Warren County, Cal.

Albany County, New York, is spelled Albany. A post office in Warren County, Cal.

attempt be made to reduce them all to one form?

In the last context, the place we now know as Sitka was known to the English as Norton Sound, to the French as Tchiktaga Bay, and to the Russians as New Archangel. The earliest of these names being Norfolk Sound. Is there any doubt in this case as to the necessity of retaining the name Sitka?

The great sea between North-eastern Asia and Northwestern America, at one time known as the Sea of Okhotska, and now known as Bering Sea, has been variously written Bhering Sea, Bering Sea, bearing Sea, bearing Sea, as well as all these forms with the addition of the anastrophe "s." I do not ask what is the correct name, for the question in this form seems to imply that there is a correct form, and all other forms are erroneous. The question should rather be, what form is it advisable to deal with on this view, and on this, of securing its general adoption?

And this brings up the question of possessives generally in specific geographical names. Many specific geographical names have the possessive form, while many others do not. Is it advisable to attempt to secure uniformity of usage in this regard? I will frankly avow my own conviction, on which has rested for no more or less consideration an history of the matter to be, that the use of the possessive form should be discouraged and abandoned as far as practicable. While it seems to me unwise to lay down a hard and fast rule, yet there are a very large number of cases in which the possessive form may be dropped to a advantage and without, I think, arousing any general opposition to the practice. When the theory held that the King owned all, and geographic features were named for the royal family or for the monarchy, the possessive form was very frequently used in historical passages or on old maps.

Now the possessive form has now disappeared from the maps. Why should not the possessive form be used to denote possession only? A pond, a hill, a swamp lying on Smith's land may be properly designated as it often is, as Smith's pond, Smith's hill, etc. But nobody would think of saying Madson's Lake, or Washington Monument. There appears to be a decided tendency in this direction.

Those particular features which are named for individuals, such as states, cities, towns, streets, parks, etc., which are named for individuals are almost universally named with the possessive form. And this custom is itself a reasonable practice. When, therefore, cutting off possessives from all names where usage has now fixed them with considerable firmness, there yet remains a considerable body of geographical names in which the possessive form remains, but which are not strongly intermingled with other usages. In such cases it seems to me we may advantageously drop the possessive form. Let us say Donner Lake, not Donner's Lake, Hudson Bay, not Hudson's Bay, James Bay, not James' Bay, Baffin Bay, not Baffin's Bay, etc., etc.

MR. THOMSON: I hardly know how I came to be brought into this discussion. The Secretary caught me in his net unawares and unprepared. I do not propose to trespass long on your time, nor do I suppose I shall add anything to a philosophical discussion of geographic nomenclature. I only wish to call your attention to a few principles that obviously should be followed in the selection of new geographic names and to show some absurdities and difficulties which are likely to occur if no sentiment in favor of the old nomenclature is allowed full liberty. A geographic name should be short, euphonic, pronounced as spelled, and have a meaning or express some sentiment to help fix it in the memory. Especially should these principles govern when we consider that in this road, in our school-days, we obtain by far the greater portion of our geographic knowledge.

The old Spanish explorers followed these rules largely in their geographic nomenclature, and although "Sierra" and "Sierra" occur with alarming frequency, there is always some reason for the appellation; either they saw a line of peaks cut the horizon or the cresting denoted the natal day of the holy martyr "Rio Doce" and "Las Animas" are certainly better than "Sorrow Creek" or "Soul Wash," and even "Purgatory" though the Colorado cow-boy corrupts it into "Picket Ware" is better than "Cottonwood Creek."

Some Indian names are very expressive, characterizing topographic features. In northern Arizona is a steep volcanic peak or needle, its sharp sides rising in one step twelve hundred feet above the surrounding country. From the base of this pinnacle, two long lava dykes stretch on either hand in a gentle curve across the mesa. The resemblance to the spreading wings of a bird is striking, and the Navajo Indian calls the rock "Aga-ma" or "Flying Bird." A name well worthy, it seems to me, of being placed on the maps of that region, as it is on the one I hold in my hand. But on the same map, or at least on a single, is "Tee-tah-a-let Lake," a barbarous appellation, impossible to pronounce and an oddity. Nor can I say less in denunciation of "Zuni-ey-in Mesa"—a name that needs intimate acquaintance with Zuni and Navajo gutturals to have any meaning. But what shall we say of "Haw-kaw-dot-kush-tah-on?" the Navajo name for what the white man calls with better propriety, it seems to me, for our maps, "Haverton Wash." "Flag Spring" could hardly be worse in English. And here is "Si-

not-sad-be-ah-e Cañon" (pronounce it as you please or can) sandwiched between "Golán Mesa" and "Tupacari Valley" and he hardly knows which to prefer, Ind an or English!

Chino and Muerto" the Cañon of the Dead—so named from the discovery of mummified or rather desiccated Ind an bodies in its cliffs—seems very appropriate, but its better edition—"Cañon de la Muerte," I am afraid Cañon de Shay, will be neither spoken nor written correctly.

On this same map are shown two small mesas, crowned with forests and standing beautiful and symmetric in the landscape. They attract attention at once and the Indian, with a fine sense of appropriateness, names them "Son-as-la" the "Twin Stars", an Indian name well worthy of being retained. Some patriotic American has named the deep gorge separating the "Stars" "Washington Pass," a good example of the right name in a wrong place.

The sense of broad humor that often characterizes the Indian leads him to sometimes give the mountain a name expressive of contempt or bearing a meaning hardly translatable to our people—"Nasdot-so-o Peak" is an example—and I confess, with considerable justification, that I was the victim in this case.

I present these instances, Mr. Chairman, to emphasize the necessity of adopting some guiding principles to aid us in the selection of geographic names.



## APPENDIX

## RULES FOR THE ORTHOGRAPHY OF GEOGRAPHICAL NAMES.

ADAPTED BY MR. FENNER.

*British System—French System—German System—Alphabetical,  
Russian English, English Russian.*

## BRITISH SYSTEM.

*Rules adopted in 1856, by the Royal Geographical Society of London  
for the Orthography of Native Names of Places.*

Having considered the present want of a system of  
orthography, and the consequent confusion and  
inconvenience attending the want of uniformity in  
the orthography of geographical names, the following  
rules have been adopted:

1. The following rules for such geographical names as are not in the  
countries to which they belong, written in the Roman character  
(these rules are identical with those adopted for the Admiralty  
charts, and will hereafter be used in all publications of the  
Society)

1. No change will be made in the orthography of foreign names  
in countries which use Roman letters; thus Spanish, Portuguese,  
Dutch, etc., names will be spelt as by the respective nation.

2. No change will be made or made in the spelling of such  
names or names which are not written in Roman character as  
have become by long usage familiar to English readers; thus  
Canton, Cathay, Celebes, Mecca, etc., will be retained in their  
present form.

3. The true sound of the word as locally pronounced will be  
taken as the basis of the spelling.

4. An approximation, however, to the sound as a whole, not at  
a system which would attempt to represent the more delicate  
reflections of sound as we should be able to do. The system  
of the present day is a very imperfect representation  
of the written name, must learn it on the spot by a study of local  
accent and pronunciation.

5. The broad features of the system are that vowels are pro-  
nounced as in Italian and consonants as in English.

6. The apostrophe is used, the acute, to denote the syllable  
which stress is laid. This is very important, as the sound of

many names are entirely altered by the misplacement of this "stress."

7. Every letter is pronounced. When two vowels come together, each of them is sounded, though the result, when spoken quickly, is sometimes scarcely to be distinguished from a single sound, as in *ai, au, ei*.

8. Indian names are accepted as spelt in Hunter's Gazetteer. The simplification of the name is given below.

Letters.	Pronunciation and Remarks.	Examples.
a	ah, as in father.	Java, Bannam, <del>Sumatra</del> <i>Star</i> .
o	oh, as in thought.	Tel-el Ketur, <del>Chib</del> <i>Yam</i> . Medan, Layanah, Peru.
i	English <i>i</i> , as in machine, the <i>i</i> of <i>ice</i> or <i>bet</i> . Thus, not <i>Negee</i> , but <i>Nepi</i> . Hindi.	
u	as in <i>note</i> .	Tokio.
e	long as in <i>plate</i> , the sound of <i>ay</i> in <i>day</i> . <del>Yarra, Tanna, Mosoa, Jorla.</del> All vowels are shortened in sound by Yarra, Tanna, Mosoa, Jorla, doubling the following consonant. Doubling of a vowel is only necessary where there is a distinct repetition of the vowel.	
ai	long as <i>i</i> as in <i>ice</i> .	Stanghian.
au	long as <i>o</i> as in <i>boat</i> . Thus, not <i>Flachow</i> , but <i>Flo-ah</i> .	
ay	as the sound of the two Italian vowels, <i>ai</i> and <i>ei</i> . In <i>ai</i> is frequently altered over, when it is scarcely to be distinguished from <i>ey</i> in the English <i>they</i> .	Yarra, Tanna, Mosoa, Jorla.
h	English <i>h</i> .	
ch	is always soft, but is so nearly the Chinese sound of <i>f</i> that it should be written <i>feh</i> . <del>feh</del> If <i>feh</i> were not already recognized it would be written <i>feh</i> .	
ch	is always soft as in <i>church</i> .	Ching-han.
d	English <i>d</i> .	
f	English <i>f</i> . <i>ph</i> should not be used for the sound of <i>f</i> . Thus, not <i>Harphong</i> but <i>Hafong</i> .	Hafong, Naha.
g	as in <i>go</i> . <del>Yarra, Tanna, Mosoa, Jorla.</del> is a weak <i>y</i> sound when <i>ay</i> rises.	
j	English <i>j</i> . <i>y</i> sh and never be put for this sound.	Japan, Jorluhan.
k	English <i>k</i> . <i>j</i> should always be put for the hard <i>c</i> . Thus, not <i>Corra</i> but <i>Korra</i> .	
k	as in <i>cat</i> or <i>king</i> .	Kor.
kh	as in other gutturals, as in the Turkish <i>kagh</i> , <i>kama</i> .	
l	English <i>l</i> .	
r	has two separate sounds, the one hard as in the English word <i>finger</i> , the other as in <i>finger</i> . As <i>l</i> the two sounds are rarely employed in the same form. <i>r</i> , too, attempt is made to put English between <i>ll</i> .	

[illegible]

FILETIME SYSTEM

RULES ADOPTED IN APRIL, 1898, BY THE SOCIÉTÉ DE GÉOGRAPHIE AT  
PARIS, FOR THE ORTHOGRAPHY OF NATIVE NAMES OF PLACES

The geographical nature of countries in which the Bureau is employed is another factor which must be considered, and the assistance of a person familiar with the orthography of the country to which he is assigned.

The following rules apply solely to geometric line numbers:

• without a written language, and no geographic names, and no other words other than the Roman character to employ in writing.

Names of places for which the orthography, through long usage, has become conventional will, however, be preserved from the rules. Examples: La Moquette, Naples, London.

The rules in context are:

4. The vowels *a*, *e*, *i*, and *u* are pronounced as *o* French, Spanish, Italian, and German. The letter *e* shall never be *re* or *ri*.

2. The branch sum of  $a$  and  $b$  is represented by  $a$  with a  $\wedge$  above the bottom  $a$ .

3. The French *o* and *e* (and *oe*) are represented by *o*, as in Dutch, Spanish, *e* (as) German.

4. The French sound *ou* (as in *ou* in *ou*) is represented by the character *o* and is pronounced as in *ou*.

5. The English sound of *u* (as in *u* in *u*) is represented by the character *u* (as in *u* in *u*) and is pronounced as in *u*.

6. The French sound *h* (as in *h* in *h*) is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

7. *g* and *g* have always the hard French sound as in *g* in *g*, *g* in *g*.

8. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

9. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

10. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

11. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

12. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

13. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

14. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

15. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

16. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

17. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

18. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

## ORTHOGRAHY SYSTEM

1. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

2. The sound *h* is represented by the character *h* (as in *h* in *h*) and is pronounced as in *h*.

word a German orthography has been generally adopted, as *Isipho abantu*, *Ncwabe*, *Isizwe*, etc. Other foreign names which are generally known and whose orthography has been generally adopted, as *Zanzibar*, not *Zanzibar*; *Zulu*, not *Sulu*, will not be changed.

The letters are pronounced as follows:

a, as *our* *father*

b, as *bow* (*bow* to *bow*)

c, as *John*

d, as *the* *father*

e, as *in* *best*

f, as *in* *four*

g, (*g*, *gh*)

h, (*h*, *hh*) retain the German sounds

i, (*ie*, *ih*)

j, as *in* *James*

k, as *in* *much*

l, as *let* or *as one* sound

m, as *in* *the*

n, d, g, b, j, k, l, m, p, r, s, t, u, v, x and z retain their German sounds

f, retains the German sound z also for *ph*, but the latter will not be used

c, always soft (as *z*) For the sound of *k*, c is not to be used

q, for the English (*q*)

q, will not be used; it is replaced by *k* or *g* respectively by *ch*, as *bach*

x, as *sch*

y, is only used for the consonantal sound, not for

an, oriental guttural sound (*Daugh, tabakh*).

kh, oriental guttural sound (*Khana*).

v, is always soft; not to be used to give the sound of *f*

When a vowel is to be pronounced clear and open the following consonant will be doubled (*Tanna, Mokka, Honny*). To lengthen a vowel sound, it will not be doubled, but if the vowel is repeated each will be pronounced separately (*Nimukha, Gommor*).

But our accent (') will be used to indicate if particularly necessary, that in exceptional cases, the syllable on which stress is to be laid (*Matt'pe*).

RUSSIAN-ENGLISH

English	Russian	English	Russian
A	а	Б	б
B	б	В	в
C	с	Г	г
D	д	Д	д
E	е	Е	е
F	ф	Ж	ж
G	г	З	з
H	х	И	и
I	и	Й	й
J	ж	К	к
K	к	Л	л
L	л	М	м
M	м	Н	н
N	н	О	о
O	о	П	п
P	п	Р	р
Q	кв	С	с
R	р	Т	т
S	с	У	у
T	т	Ф	ф
U	у	Х	х
V	в	Ц	ц
W	в	Ч	ч
X	х	Ш	ш
Y	й	Щ	щ
Z	з	Ъ	ъ

ENGLISH-RUSSIAN.

a	A	z	И	p	П	q	б
b	Б	z	И	r	Р	u	В
ca	Ч	z	К	s	С	ya	Я
d	Д	zh	Ж	sh	Ш	ye	Е
e	Е	f	А	sch	Щ	yo	Ю
g	Г	m	М	t	Т	z	З
h	Ф	n	Н	ch	С	zh	Ж
gh	Г	x	О	ts	Ц	i	И
v	В	o	У	u	У	-	б







